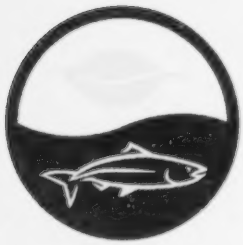

Pacific Fisheries Resource Conservation Council

Annual Report 2004

ANNUAL REPORT
2004

Pacific Fisheries Resource
Conservation Council

April 2005

Pacific Fisheries Resource Conservation Council Annual Report 2004

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Pacific Fisheries Resource Conservation Council
Conseil pour la conservation des ressources halieutiques du pacifique

April 2005

The Hon. Geoff Regan
Minister of Fisheries and Oceans
Government of Canada
Parliament Buildings
Ottawa

The Hon. John Van Dongen
Minister of Agriculture, Food and Fisheries
Province of British Columbia
Legislative Building
Victoria

Dear Ministers:

This seventh annual report of the Pacific Fisheries Resource Conservation Council is presented to you by all of us who serve as members, in accordance with our mandate.

This annual report presents a compilation of the activities we initiated and the advice we provided to you on the status of wild salmon and steelhead stocks and their freshwater and ocean habitats.

This is also the final annual report during my tenure as Chair of the Council. As you know, I have accepted the invitation of Premier Gordon Campbell to head the new Pacific Salmon Forum, effective April 2005.

New and serious salmon conservation problems are emerging, and the role of the PFRCC will be all the more important in the coming years. The Council members will continue to provide a valuable service to Canadians by offering advice to you and your officials, on behalf of the public, that will help protect the Pacific salmon resource. Canadians deserve the continued support of individuals and organizations concerned with protecting salmon for future generations.

I wish to thank my fellow Council members for their unfailing wisdom and good humour, and the staff and consultants who have worked diligently with us and to acknowledge the continuing support of both the Federal and Provincial governments.

John A. Fraser
Chairman, September 1998 to March 2005
Council member from April 2005

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Pacific Fisheries Resource Conservation Council
Conseil pour la conservation des ressources halieutiques du pacifique

Avril 2005

L'honorable Geoff Regan
Ministre des Pêches et des Océans
du Canada
Gouvernement du Canada
Édifices du Parlement
Ottawa

L'honorable John van Dongen
Ministre de l'Agriculture, de l'Alimentation
et des Pêches
Gouvernement de la Colombie-Britannique
Édifice législatif
Victoria

Messieurs les ministres,

Ce septième rapport annuel du Conseil pour la conservation des ressources halieutiques du Pacifique vous est présenté par l'ensemble des membres de ce dernier, conformément à leur mandat. Ce rapport annuel présente une compilation des activités dont nous avons pris l'initiative et des conseils que nous vous avons donnés sur l'état des stocks de saumon sauvage et de saumon arc-en-ciel ainsi que sur la qualité de leurs habitats dulcicoles et marins.

Il s'agit du dernier rapport annuel qui sera déposé pendant mes fonctions de président du Conseil. Comme vous le savez, j'ai accepté l'invitation du premier ministre Gordon Campbell à diriger le nouveau Forum du saumon du Pacifique, qui entrera en activité en avril 2005.

La conservation du saumon fait maintenant face à des problèmes nouveaux et graves, et le rôle du CCRHP n'en sera que plus important au cours des années qui viennent. Les membres du Conseil continueront de fournir aux canadiens un service précieux en donnant à vous-mêmes et à vos agents des conseils qui contribueront a protéger les ressources en saumon du Pacifique. Les Canadiens d'aujourd'hui et de demain méritent que les particuliers et les organisations qui travaillent à protéger le saumon ne relâchent pas leurs efforts.

Je tiens à remercier mes collègues du Conseil pour leur sagesse et leur sens de l'humour, ainsi que le personnel et les consultants qui ont travaillé diligemment avec nous. Je remercie aussi le gouvernement fédéral ainsi que le gouvernement provincial pour leur appui.

John A. Fraser
Président, de septembre 1998 à mars 2005
Membre du Conseil depuis avril 2005

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EXECUTIVE SUMMARY

The effective management of Pacific salmon continues to be undermined by reduced government budgets, declines in stock assessment activity and loss of capacity in enforcement, habitat protection and fisheries research. The members of the Pacific Fisheries Resource Conservation Council, in their 2004 annual report, point out that the federal government continues to fail in meeting its obligations to conserve and scientifically manage the Pacific salmon fisheries. The federal department responsible for fisheries is struggling with reduced resources and lacks the ability to perform all of the functions it is mandated to perform.

At the same time, the Council notes that the new federal government document entitled *Draft Framework for the Conservation of Pacific Wild Salmon* demonstrates a more strategic approach to salmon management that bodes well for the future.

The Council's annual report reviews the reports and positions issued during the past year, including the following:

- The Council's February 2004 paper on Central and North Coast stocks pointed out the detrimental impacts of Fisheries & Oceans' reduced assessment and survey coverage, and the loss of public confidence in the commitment and capacity to protect the salmon resource.
- The technical report on overspawning issued in June 2004 verified the view that high levels of escapement do not lead to the subsequent collapse of stocks.
- Community stewardship is being inadequately supported in spite of the exceptional contribution of these volunteer efforts, in the view of the authors of a background paper prepared for the Council and the Vancouver Foundation.
- The evolution of commercial fisheries from a large industrial scale to the current smaller more controlled scale can improve salmon conservation. Further such changes during the conduct of the fishery may be a way for the salmon fleet to remain economically competitive while protecting the stocks from over-exploitation.

The Council's 2004 annual report acknowledges several recent success stories involving government leadership. Among these are the measures leading to the recovery of coho salmon in southern and northern areas of the province, selective fishing that successfully reduced by-catch, recovery of Skeena steelhead, and protection of endangered stocks through innovative agreements with First Nations.

The Council's projected 2005 work program includes studies and advisories on steelhead, First Nations and recreational fisheries, and indices to measure aquatic salmon habitat in terms of its influence on salmon survival and production.

RÉSUMÉ

L'efficacité de la gestion du saumon du Pacifique continue à être menacée par la réduction des budgets gouvernementaux, des activités d'évaluation des stocks et des capacités dans les domaines de l'application de la loi, de la protection des habitats et de la recherche sur les pêches. Dans leur rapport annuel de 2004, les membres du Conseil pour la conservation des ressources halieutiques du Pacifique font remarquer que le gouvernement fédéral continue à ne pas assumer ses responsabilités en matière de conservation et de gestion scientifique des pêches du saumon du Pacifique. Le ministère fédéral responsable des pêches doit faire avec des ressources de plus en plus réduites et n'a plus la capacité d'effectuer toutes les fonctions prévues par son mandat.

Le Conseil remarque par ailleurs que le nouveau document du gouvernement fédéral intitulé *Ébauche du cadre de travail pour la conservation des saumons sauvages dans le Pacifique* fait preuve d'une approche plus stratégique pour la gestion du saumon et annonce un avenir plus prometteur.

Le rapport annuel du Conseil contient un examen des rapports et des positions publiés au cours de l'année dernière, notamment:

- L'article du Conseil, publié en février 2004, sur les stocks de la côte centrale et de la côte Nord, a fait ressortir l'impact négatif de la réduction de la couverture des évaluations et des relevés effectués par Pêches et Océans Canada et la perte de confiance du public concernant l'engagement et la capacité du gouvernement à protéger la ressource que constituent les stocks de saumons.
- Le rapport technique sur le frai excessif, publié en juin 2004, a confirmé le bien fondé du point de vue selon lequel de hauts niveaux d'échappée n'entraîneraient pas nécessairement un effondrement ultérieur du stock en question.
- La gérance communautaire n'est pas soutenue de manière adéquate en dépit de l'aide exceptionnelle apportée par les bénévoles, selon les auteurs d'un document d'information préparé pour le Conseil et la Vancouver Foundation.
- Une gestion des pêches commerciales qui passent de l'échelle industrielle à une échelle plus petite et plus contrôlée peut être plus efficace pour la conservation du saumon. De tels changements mis en place durant les pêches pourraient permettre aux pêcheurs de rester compétitifs sur le plan économique tout en protégeant les stocks contre toute surexploitation.

Le rapport annuel 2004 du Conseil cite plusieurs réussites récentes du leadership gouvernemental, notamment les mesures qui ont permis le rétablissement des saumons Coho dans les secteurs Sud et Nord de la province, la pêche sélective qui a permis de réduire efficacement le nombre des prises accessoires, le rétablissement des saumons arc-en-ciel dans la Skeena et la protection des stocks en voie de disparition par la signature d'ententes innovatrices avec les Premières nations.

Le programme du Conseil pour 2005 comprend des études et des avis concernant le saumon arc-en-ciel, les Premières nations et les pêches récréatives, et la détermination d'indices permettant de mesurer l'influence de la qualité de l'habitat du saumon sur la survie et le taux de reproduction de ce poisson.

1. OVERVIEW

The Pacific Fisheries Resource Conservation Council (PFRCC) was created to assist governments in taking a comprehensive approach to the conservation of Pacific salmon and steelhead and to foster a better understanding of the complex freshwater and marine ecosystems upon which these species depend.

The PFRCC is a council reporting to ministers, with its membership appointed at the ministerial level by an order of the Cabinet. The members endeavour to provide an overview perspective on long-term strategic priorities for the conservation of salmon and their habitats. They produce Advisories containing the consensus views of Council members along with specific recommendations to guide decisions by governments and fisheries sector stakeholders. These Advisories over the past six years have encompassed such diverse topics as the Wild Salmon Policy, fisheries science education, sockeye mortality, and wild/farmed salmon interactions.

Each year, the Council also sponsors Background Papers and Technical Reports that are meant to inform the consideration of current fisheries conservation issues by the Council members and the general public. Their topics have been wide-ranging and have included habitat stewardship, assessment technologies, international treaties, and gravel extraction.

The general priorities of the Council, which have remained unchanged since its inception, include:

- To advise the federal and provincial ministers on critical issues concerning the status and conservation of anadromous salmonids and their habitats. Direct ministerial requests for advice are given priority. The broad and inclusive membership of the Council enables it to identify issues and options from many perspectives.
- To become directly engaged in emerging fish conservation issues and to assist the public in understanding those issues through processes such as public consultations, conferences, workshops, published reports and websites.
- To produce and continually update comprehensive and accessible information on the status of stocks and habitat, as well as follow up on the advice provided in past reports.

This annual report provides an explanation of the activities and projects of the Council in 2004, and the results achieved. It presents a recap of the information and advice that was produced during the year, and provides an indication of the direction of the 2005 workplan.

2. Council Activities and Perspectives

During 2004, several initiatives were undertaken by the Pacific Fisheries Resource Conservation Council to build on the work of previous years, albeit with a fresh approach that deals with emerging issues from a strategic perspective.

The Council was briefed on several occasions by senior government officials who were invited to explain current activities in a wide range of areas, including fisheries research, aquaculture development and hatchery policies and practices. The Council members wish to express their thanks to those individuals who helped inform their deliberations and provided frank exchanges of views.

The Council addressed a series of important matters in 2004, and brief capsule reports on these are provided in the thirteen sections below. The full text of reports, discussions and correspondence are readily available, along with news releases in most cases, on the PRFCC website at www.fish.bc.ca.

2.1. Advisory and Background Paper on Central and North Coast British Columbia

In February 2004, the Council addressed the conservation risks that are increasing due to budget and program cuts in Fisheries & Oceans Canada. The Council found that the reductions in assessment budgets and the reduced survey coverage of Pacific salmon have been occurring just when better data are urgently needed for salmon management and decision-making, and for continuity of long-term scientific knowledge.

The Council members issued an advisory entitled *Salmon Conservation Challenges in BC with Particular Reference to Central and North Coast*. In it, the Council also cited positive indicators of better spawning results in much of the region, mainly related to reduced fishing pressure and improved marine survival conditions.

Cutbacks in the federal government's assessment and monitoring of Pacific salmon are causing a loss of public confidence in the commitment and capacity of the federal government to protect this crucial resource.

The Council called for a more explicit core assessment framework and sustained commitment of funds for implementation. Council urged Fisheries & Oceans Canada to avoid budgetary reductions in assessment that would be proportionately larger than in other programs areas.

An expert background paper accompanying the Advisory was prepared by the Council's Scientific Advisor Dr. Brian Riddell. In that paper, *Pacific Salmon Resources in Central and North Coast British Columbia*, Dr. Riddell identified current trends and specific stock management issues that require serious consideration. For example, he suggested that more information is needed about the smaller sockeye salmon populations and their genetic structure in order to halt their potential decline. He also explained the essential nature of indicator stock programs for coho and chinook salmon that are needed in order to establish a verified basis for identifying the causes of changes in those populations.

2.2 Participation in World Fisheries Congress

The Council was a strong supporter and active participant in the World Fisheries Congress held in Vancouver in May 2004. This event marked the first time the Congress has been held in North America, drawing together hundreds of government officials, academics and fisheries specialists from across the globe.

The theme of the conference was the Reconciliation of Fisheries with Conservation. PFRCC Chair John Fraser served as the rapporteur of the session dealing with ways to reconcile the interests of the fisheries communities with the views of those advocating more extensive conservation. The goal of this session was to improve communication among fisheries scientists and non-scientists and to seek understanding and constructive dialogue among interest groups. The proceedings of this session, as well as other World Fisheries Congress sessions, are expected to be released in 2005.

2.3 Hatchery and Enhancement Discussions

The Council proceeded in 2004 with a long-standing commitment to widen the public dialogue on salmon hatcheries and enhancement programs, and to investigate options for policy decisions on future development in this field. Council had contracted with Devon Knight Events to produce a report on issues related to salmon hatcheries and the interactions of hatchery fish and wild stocks. The consultants were asked by the Council to compile the current information available on the issues, and to set out the various positions that had been expressed by scientists and others, with specific reference to the interactions of enhanced and wild salmon. Their report, entitled *Making Sense of the Debate about Hatchery Impacts: Interactions between Enhanced and Wild Salmon on Canada's Pacific Coast*, was received in March 2004.

After releasing the consultants' report, the Council held public consultations by way of three community meetings, encouraging written submissions, and a series of bilateral meetings with interest groups and experts. To no-one's surprise, this initiative was controversial and it became quite clear that this is an emotionally charged subject. In particular, there was a strong reaction by some stakeholders to the consultants' report. Council members have been carefully weighing the extensive information provided from several sources in anticipation of producing an Advisory on this topic sometime in 2005.

In producing its Advisory the Council will continue to emphasize conservation issues associated with salmon enhancement. The Council recognizes that there are social and economic factors that must be taken into account in determining the future of salmon enhancement, and that a broader and balanced public evaluation of the issues of salmon enhancement and hatcheries is likely to be needed in the future.

2.4 Exchange on Aquaculture

An exchange of correspondence took place in early 2004 between the PFRCC, the Minister of Fisheries and Oceans Canada, and the Aquaculture Commissioner regarding matters concerning the Commissioner's *Recommendations for Change* report. Council was very concerned that the report lumped together Atlantic groundfish and Pacific salmon, implying that wild salmon stocks, as a whole, were in trouble, and that this was justification for the expansion of salmon aquaculture on the Pacific coast. In fact, there remains a rich diversity of Pacific salmon which are abundant in many locations. Further, the Council proposed that the legal advice to the Government of Canada on jurisdictional issues related to salmon management, which had been

expunged from a report issued by the Aquaculture Commissioner, should be released for public consideration. This information, in the view of the Council, is crucial for public understanding of the issues in this highly volatile and emotional matter.

The Aquaculture Commissioner's response was to refuse the Council's request. In responding to the Aquaculture Commissioner's position, the Chair of the Council made the following point: "The real issue here is whether the Department of Fisheries and Oceans or the Office of Commissioner for Aquaculture Development is prepared to be honest with the Canadian public and set out the jurisdictional issues that are central to the effective and transparent management of the interaction between farmed salmon and the wild salmon."

2.5 Ministerial Meetings with Fisheries Organizations

In cooperation with the Pacific Salmon Foundation and Pacific Salmon Endowment Fund, the Council held meetings with the senior federal Ministers from British Columbia and their senior staff to alert them to the current issues. These discussions enabled the participants to explore ways to enable the Government of Canada to achieve its salmon and fisheries objectives more effectively.

The discussions revolved around topics including aquaculture, Sakinaw and Cultus Lake sockeye, and proposals regarding the management of the fishery. It was recognized that Fisheries & Oceans Canada in the Pacific region could be strengthened if other fisheries organizations could be productively involved in the Department's issues related to First Nations, fisheries management and aquaculture.

The participants agreed that it would be valuable to have a widely-inclusive process that would build agreement on a strategy for the future of salmon fisheries and ways for the two levels of government to work positively with the stakeholders.

2.6 Briefings on McRae-Pearse Report

In May 2004, the Council met with Dr. Peter Pearse to receive a briefing from him on the April 2004 report he co-authored with Donald McRae, *Treaties and Transition: Towards a Sustainable Fishery on Canada's Pacific Coast.* This report presented information and recommendations that could serve as a basis for reforming the salmon fisheries management system in the Pacific Region with the intent of accommodating the rights and expectations of First Nations within an overall non-competitive fishery structure that would be fair, equitable, easier to manage, and financially viable.

Council members questioned what might be unintended effects of the proposed licensing regime especially in terms of the unique nature of salmon migrations and the application of the proposed new licensing system in circumstances where there are mixed stocks of salmon.

Council received a preliminary brief on the findings contained in the First Nations Panel report produced in conjunction with the McRae-Pearse report and dealing with aboriginal perspectives on the issues. Council notes that both the First Nations Panel report and McRae-Pearse report discuss the future role of First Nations in the fishery. There is much common ground in this respect and Council urges further efforts to reach agreement on the role of First Nations in any fishery reform efforts.

While the issues addressed by the McRae-Pearse report have relevance to salmon conservation, they are ultimately matters of catch allocation and in-season management that are specifically

beyond the mandate of the Council to address. At the same time, the Council's position is that the McRae-Pearse report proposals are more in the realm of framework policies and that it is appropriate for the Council to consider the implications of fisheries reform as it relates to the status of wild Pacific salmon.

2.7 Technical Report on Over-escapement/ Overspawning

In June 2004, the Council released a scientific paper that concluded that there is no evidence to link "over-escapement" and salmon stock collapse.

The technical paper entitled *Does Over-escapement Cause Salmon Stock Collapse?* was authored by Drs. Carl Walters, Paul LeBlond and Brian Riddell in response to a specific request from the Minister of Fisheries and Oceans for an analysis of the issue. The paper's findings did not support the argument made by some in the fishing sector that large numbers of spawners would lead to a collapse.

In essence, the authors looked at all available information from British Columbia on whether large spawning populations that exceeded "normal", target or historical numbers were followed by stock collapses. Stock collapse could result if crowding on the spawning grounds lead to superimposition of redds and the destruction of eggs; if crowding lead to disease outbreaks; or if there was severe competition for food brought on by large numbers of fry and smolts. The authors found clear evidence that there are environmental limits that result in a leveling-off of salmon production for runs having a high escapement, but that there was no evidence of over-escapement causing stock collapse.

This study is significant in that it should allay concerns that salmon stocks could be put at risk if large numbers end up spawning as a consequence of government moving to more precautionary management.

2.8 Reintroduction of Sockeye Salmon into Skaha Lake

For some years the PFRCC has been supporting the international and Okanagan Nation Alliance initiative to reintroduce salmon stocks to portions of the Canadian Okanagan River where they had been extirpated by habitat destruction especially associated with the building and operation of dams. In PFRCC's 2001–2002 *Annual Report* we outlined the issues and opportunities related to the reintroduction of sockeye salmon into portions of the Canadian Okanagan River.

On June 1st, 2004, Council was gratified to attend the reintroduction of approximately 350,000 sockeye fry into the Penticton Channel portion of the Okanagan River upstream from Skaha Lake. These fry were raised from eggs collected from the Okanagan River near Oliver the previous fall. The fry will rear in Skaha Lake for one year before beginning their migration down through the Okanagan and Columbia rivers to enter the Pacific Ocean. This was an historic occasion because for the first time in over 50 years sockeye salmon were able to occupy their traditional habitat within Skaha Lake. The objective of this long-term project is to secure the future of the only extant Columbia River sockeye population in Canada.

The Okanagan Nation Alliance took the leadership in this salmon restoration initiative and has developed partnerships for fisheries and habitat restoration with the Colville Confederated Tribes in Washington State; Fisheries & Oceans Canada; BC Ministry of Water, Land and Air Protection; and non-governmental organizations.

2.9 Community Stewardship Background Paper

In a report commissioned jointly by the Council and the Vancouver Foundation, the authors found that community stewardship groups are not adequately supported in spite of their exceptional contributions to caring for salmon habitat.

Authored by Brian Harvey and David Greer of the World Fisheries Trust, the background paper *Reality Stewardship: Survival of the Fittest for Community Salmon Groups* says that after ten years of the federal and provincial governments encouraging communities to get involved in salmon habitat stewardship, government funding for those projects has largely evaporated and many groups feel left out in the cold. This especially applies to programs aimed at watershed restoration and stabilization. Those recent cuts have amounted to more than $50 million in programs that stewards were once able to access.

The report suggested that stewardship groups must form alliances and rely more on funds from private sources. Limited government funds will shift the focus of salmon stewardship towards recovery planning, as required by the new Species at Risk Act, an activity that will also appeal to private donors and foundations. Creation and implementation of recovery plans will allow volunteers and professionals to work together rather than compete for limited funds, and require the science-based planning approach that has been missing from ad-hoc community stewardship. By setting measurable goals, a recovery planning approach is also more attractive to donors.

Among their recommendations, the authors proposed forming consortia with fund-raising and management skills and local political support. They proposed that projects need to incorporate data collection and goal-setting right from the start.

2.10 Presentation to House of Commons Standing Committee on Fisheries

The Chair and staff were invited to make a presentation to the House of Commons Standing Committee, to provide their views on the primary issues related to the disappearance of Fraser River sockeye salmon in 2004.

One of those issues is the diminished capacity of Fisheries & Oceans Canada in the Pacific region. The concern is that the federal government is now failing to meet its obligations to conserve and scientifically manage the fisheries resource. Enforcement, habitat protection and restoration, salmon enhancement, research, and stock assessment are all areas being cut. The position of the Council is that Fisheries & Oceans Canada should explain what it cannot do now that it could do previously, and be open to scrutiny about whether or not the choices being made are the appropriate ones.

Federal fisheries managers are losing access to basic information about salmon abundance, run timing, and other crucial data because monitoring has been reduced in the budget squeeze. For example, the extent and credibility of data collection for Fraser River sockeye have been reduced as a direct result of 20% cuts to the operational budgets of stock assessment.

The Council members emphasized that their observations were not an indictment of the Pacific Region of Fisheries & Oceans Canada, and noted that the budget reduction pressures were obviously causing difficulty for the Department staff.

The Council noted that there were several recent success stories involving leadership by Fisheries & Oceans Canada. Among these are the measures taken to recover coho salmon in southern and

northern British Columbia, the success of selective fishing in reducing by-catch, Skeena steelhead recovery, and innovative agreements with First Nations to speed the recovery of endangered stocks.

2.11 Pacific Salmon Forum

In December 2004, Premier Gordon Campbell announced the establishment of an independent Pacific Salmon Forum to address the sustainability of British Columbia's wild and farmed salmon.

This Forum was initiated when an impasse was reached in discussions between the federal and provincial governments over their pledge to implement a Salmon Aquaculture Forum. After implementation delays, Premier Campbell decided to act unilaterally by creating the Pacific Salmon Forum with a broad mandate to resolve and develop consensus on salmon aquaculture issues and to outline areas, under provincial jurisdiction, where the conservation of wild Pacific salmon could be assisted.

The Pacific Salmon Forum differs from the PFRCC in several ways and should be viewed as complementary to the Council. The scope of the Forum extends beyond conservation and encompasses the full array of considerations needed to determine a balance among the overlapping and often conflicting economic, social and environmental interests involved in aquaculture, fisheries, conservation and resource use. It will operate with a budget more than twice as large as the PFRCC's, and report through a Legislative Committee.

It will address research questions to government agencies and academic institutions, and analyze both scientific and socio-economic issues. It will also draw on traditional ecological knowledge and make use of international research and expertise.

The Honourable John Fraser will serve as Chair of the new Pacific Salmon Forum. Accordingly, he will relinquish his position as Chair of the PFRCC on April 1st 2005 but will continue to sit as a PFRCC member.

2.12 Commercial Fisheries Background Paper

The significant changes that the commercial salmon fishery has undergone in the past several decades are explained in a background paper prepared for the Council and issued in December 2004.

Prepared by fisheries experts Stuart Nelson and Bruce Turris, the background paper entitled *The Evolution of the Commercial Salmon Fisheries in British Columbia* chronicles the management and operation of the province's commercial salmon fishery over the past six decades.

The paper portrays the evolution from before the 1950s when salmon were plentiful enough to satisfy all users, to the current period of rationing access and ensuring conservation. It presents a historical account of fishing activity and fisheries management during the last half of the century, and how the fishery adjusted from a large industrial scale to one that is smaller, more controlled, and designed to improve salmon conservation.

Concluding that British Columbia will never return to the large-scale mixed-stock industrial fisheries that existed in the 1960s to 1990 period, the authors suggest that reducing competition during the conduct of the fishery may be a way for the province's salmon fleet to remain economically viable. This would involve more small-scale harvests throughout each migration period, instead of large intensive fisheries near the peak of the run. Control over the amount of

salmon being harvested is critical to ensuring that catches are kept within allowable limits. The commercial fishing industry would then have the opportunity to maximize value rather than volume, and to innovate in the use of selective fishing methods to protect weak stocks. The fleet has already shown a willingness and ability to harvest selectively.

In the near future, the Council will sponsor similar reviews of the evolution of recreational and First Nations fisheries, using the Commercial Salmon Fisheries report as a guide.

2.13 PFRCC Website Development

The Council has been working behind the scenes to completely redesign and upgrade its website. The site will have an entirely new, more streamlined look. Each webpage will feature new, interesting pictures of salmon and their habitat. The updated website architecture will make it easier to find our reports and a new internal search engine will allow for searches of our reports for particular content detail. We believe this will make our work more accessible to researchers and the general public.

Since one of the responsibilities of the Council is to report not only to Ministers of the two levels of government but also to British Columbians, we believe that it is crucial for the future of the salmon resource to have people aware of the threats and opportunities that have emerged in recent years. Our website is meant to provide the information that can be used by a wide cross-section of the public to understand what can and should be done to protect and conserve British Columbia's salmon.

A new additional focus of the site will be a Students and Teachers section through which the Council will be aiming to improve understanding of fish and fisheries issues for audiences of all ages.

3. Key Issues and Priorities

The Pacific Fisheries Resource Conservation Council has a mandate to report on current issues and advise Ministers on those that appear to require attention or decisive action. By adhering to this mandate, the Council might appear at times to be overly negative in its approach or placing too much emphasis on problems, instead of celebrating improvements in salmon stock status and habitat conditions.

The Council members wish to point out that they have, in many instances, noted improvements that have been made in salmon management and given credit to initiatives, such as Water Use Planning, that have led to impressive results. The Council is seeking a balance in its role as both a critic and an acknowledger of progress. The following three issues are presented as a reminder of the Council's effort to deal with issues in an even-handed way, but to not hesitate to call for decisive action where it is essential.

3.1 Salmon Stock Status

Pacific salmon stocks in 2004 were in better shape than the previous year in terms of overall production, returns, escapement, catch and other appropriate criteria.

The salmon stocks had the benefit of satisfactory ocean conditions and water flows for migration in most instances. Their production, especially coho, reflected the continued positive effects of fishing restrictions that have led to progressive rebuilding of stocks in many areas over the past several years.

There were also troubling exceptions to the general trend towards stock improvement. In some cases, stocks are far from healthy. For example, the table below shows population groups of coho, chinook, pink and chum that have shown multiple indications of poor or declining status sufficient to warrant immediate assessment to determine their status. The three groups of coho are part of the interior Fraser complex that have already been listed as endangered by the government's scientific criteria through the Committee on the Status of Endangered Wildlife in Canada (COSEWIC).

Table 1. Salmon population groups with multiple indicators of poor or declining status.

Species	Proposed population group	Assessment priority
coho	Upper Fraser	[A]COSEWIC-endangered
coho	Middle Fraser	[A]COSEWIC-endangered
coho	Fraser Canyon	[A]COSEWIC-endangered
pink-odd year	Outer Graham Island	[B] urgent
pink-odd/even year	Hecate Strait-Q.C. Sound	[B] urgent
chinook	Okanagan	[B] urgent
pink-even year	North Graham Island	[B] urgent
pink-odd year	Vancouver Island Coastal Current	[B] urgent
pink-odd year	Puget Sound-Georgia Basin	[B] urgent
coho	Lower Fraser	[B] urgent
chinook	Southern Coastal Streams	[C] high
pink-even year	Puget Sound-Georgia Basin	[C] high
chum	Nass River-Portland Canal	[C] high
pink-even year	Skeena River	[C] high
chinook	Northern Coastal Streams	[C] high
chinook	West Vancouver Island	[C] high
pink-even year	Vancouver Island Coastal Current	[C] high

The foregoing table shows the assessment priority which is given to reflect the extent of the apparent declines in the health of these stocks, and suggests the degree of urgency that should be adopted in determining the actual stock status and what could be done to mitigate or reverse the apparent declines.

The following table is a summary of assessment priority by species for population groups of coho, chinook, pink and chum. Note that three of the 52 population groups have already been listed as endangered. Multiple indications of poor status are showing for 15 of the remaining 49 groups, and these should be assessed immediately to determine their actual status. Over half of the population groups (29 of the 52) are stable or increasing in abundance.

Table 2. Assessment priority by species.

Assessment priority	Species	Count of Population grouping
[A] COSEWIC-endangered		3
	coho	3
[B] urgent		8
	chinook	1
	coho	1
	pink-even	2
	pink-odd	4
[C] high		7
	chinook	3
	chum	1
	pink-even	3
[D] moderate		5
	chinook	1
	chum	1
	pink-even	2
	pink-odd	1
[E] low		29
	chinook	12
	chum	6
	coho	10
	pink-odd	1
Grand Total		**52**

Sockeye have been investigated separately because of their unique population structure. For sockeye, nearly every lake would be considered a designatable unit (having sufficient genetic diversity to protect it) under the Species at Risk Act. The population groups presented in the following tables therefore consist of multiple such units and have been grouped because they are generally managed together.

The following table shows the population groups with an assessment priority of high or urgent.

Table 3. Population groups with assessment priority of high or urgent.

Species	Population group	Assessment priority
sockeye	Southern Coastal Streams	[B] urgent; with two populations as [A]COSEWIC-endangered
sockeye	Homathko-Klinaklini	[B] urgent
sockeye	Lower Skeena	[B] urgent
sockeye	Okanagan	[B] urgent
sockeye	Vancouver Island Non Glaciated (NEVI)	[B] urgent
sockeye	West Vancouver Island	[B] urgent
sockeye	Middle Fraser	[C] high
sockeye	Northern Coastal Streams	[C] high
sockeye	Queen Charlottes	[C] high
sockeye	Thompson	[C] high

The following table shows the number of population groups within each of the assessment priorities. Note that two populations within one group have already been listed as endangered (Sakinaw and Cultus are in this group), while nine of the remaining groups have shown multiple indications of poor or declining status. The populations within these groups should be assessed immediately to determine their actual status.

Table 4. Number of population groups within each of the assessment priorities.

Assessment priority	Number of population groups
[A]COSEWIC-endangered	1
[B] urgent	5
[C] high	4
[D] moderate	4
[E] low	3
Grand Total	17

The foregoing tables demonstrate the need to look beyond economically important stocks if conservation of diversity is a high priority. This need reinforces Council's concerns that Fisheries and Oceans Canada does not have adequate resources to ensure that conservation receives the attention that it should (please see 3.3, below).

3.2 Research in the Broughton Archipelago

Ever since the Council's sponsorship of an October 2002 consultation on pink salmon declines in the Broughton Archipelago, there has been a continuing debate about possible interactions between wild and farmed salmon in the area that may have had a cause-and-effect relationship.

In the wake of advice from the PFRCC and public outcry about this matter in early 2003, the governments of Canada and British Columbia initiated some research and monitoring in the region, along with some restrictions on the location of farmed salmon in the migration routes. These activities were welcomed by the Council.

After that single season of research, the two governments have reduced their research spending in the region. Government research, to date, has skirted the issues of detecting whether or not there is a link between sea lice on farmed salmon and those on wild salmon, and whether sea lice are contributing to pink salmon mortality. The Council is encouraging the two levels of government to devote their research resources and their scientific investigation resources to these important questions.

The persistent failure of the governments of Canada and British Columbia to gain public trust for their management of salmon aquaculture has been a matter of great concern to the Council. The nasty debate between proponents (including governments) and opponents of salmon aquaculture led to the matter becoming known as the "War in the Water". The Council advocated the creation of a forum to separate fact from fiction and build a middle ground of consensus and rational dialogue. The Government of British Columbia's creation of the Pacific Salmon Forum is meant, in part, to help achieve that objective.

3.3 Diminished Capacity to Conserve Pacific Salmon

During 2004, as in previous years, the Council drew public attention to the federal government's declining ability to carry out the tasks involved in effective fisheries management. The Council has become increasingly concerned that the federal government is now failing to meet its obligations to conserve and scientifically manage the fisheries resource. Clearly, attention to wild salmon is diminishing.

It is noteworthy that the energies of the Pacific Region of Fisheries & Oceans Canada that should be directed towards managing the resource are being consumed by attempts to deal with budget cuts. The Council would rather those budget cuts not occur, but they are a reality and it is vital that the government and public are made fully aware of the total impact of the spending reductions in terms of the conservation and protection of salmon and their supporting habitat. The controversy over the 2004 season management of the Fraser River sockeye has been fuelled by the widespread suspicion that budget cuts contributed to the significant inaccuracy in estimates.

Enforcement, habitat protection and restoration, salmon enhancement, research, and stock assessment are all areas in which the federal government's capacity to do the full job is questionable. It is time for Fisheries & Oceans Canada to explain what it now cannot do that it previously could do, and to open its management to scrutiny about whether or not the choices being made are the appropriate ones. It is also time, if British Columbians are sufficiently concerned about salmon conservation, to put pressure on the federal government to apply its resources and policy emphasis towards improving salmon management.

It is apparent to the Council that Fisheries & Oceans Canada is increasingly unable to collect the basic information needed to manage Pacific fish stocks. The Council's February 2004 Advisory

pointed out the crucial nature of databases and historical monitoring, and explained the purpose that a core stock assessment framework would serve. And yet, the shortcomings in salmon assessment are worsening.

A continuing decline in salmon assessment may result in the loss of the most tangible and reliable information that is available for future salmon stock management. Without this information collected and analyzed, salmon management may revert to being based on little more than theoretical notions and bold guesses.

4. Future Initiatives

The Council is proceeding with another ambitious workplan in 2005. Continuing into this year from 2004 will be five studies that were already underway or anticipated at that time. The first is a review of steelhead status in British Columbia. Work is also proceeding on the Council Advisory on salmon hatcheries and enhancement that has been in the discussion and drafting stages for several months.

Two other studies anticipated from last year are background papers on the evolution of the First Nations and recreational fisheries, to complement the PFRCC's initial study of the commercial fisheries issued in 2004. Finally, the PFRCC is in the final stages of issuing a report on the impacts of agriculture in the upper Fraser River valley on salmon survival.

The Council's agenda for 2005 includes the plan to be deeply involved in the next stage of development of the federal government's Wild Salmon Policy that is proceeding to the implementation stage after several years of delay. Canada's entire salmon conservation strategy is likely to hinge on the degree of effectiveness that the Wild Salmon Policy can achieve. The PFRCC will work closely with Fisheries & Oceans Canada and all of the interested organizations to assist with the implementation challenges presented by the Wild Salmon Policy in order to make it a workable and effective tool for salmon conservation.

In this focus on the Wild Salmon Policy, the Council will ensure close liaison with Fisheries & Oceans Canada and other participants to ensure that duplication does not occur and full advantage is taken of available expertise.

The Council plans to proceed with a study of macro-scale habitat indices. This study will identify the quantitative factors that could be used to determine the state of habitat for salmon. Using the Wild Salmon Policy as a reference point, the objective of the effort will be to create a measurement capability equivalent to salmon stock monitoring, in order to measure the influence of habitat on salmon survival and production.

The opportunities for stock assessment through partnerships with public and private sector groups will be investigated by the PFRCC. This initiative also relates to the Wild Salmon Policy and the budget constraints that make the status quo in stock assessment unsustainable. The transition to such an arrangement would require considerable care, and the Council is positioned to provide an inclusive approach that should involve First Nations, industry and community volunteers to establish a new assessment framework.

A Council review of the meaning and practical application of an "ecosystem approach" will proceed in 2005 in an effort to help fisheries managers define how management of the salmon resource can incorporate what have, so far, been vaguely defined as "ecosystem values". The establishment of tangible criteria and a significant degree of consensus on an appropriate approach will be objectives in this review.

Finally, Council is very concerned regarding the implications of climate change to the survival of the salmon resource and will be conducting an outreach project to improve public awareness. Council believes that climate change is increasing the uncertainty of ocean and freshwater conditions and that, as a consequence, salmon returns, salmon survival and the task of fisheries management are becoming more difficult. As an initial project related to this subject, Council will build on its previous low-flow advisory to increase public awareness of the increasing uncertainty and risks to the fisheries resource associated with climate change. A more informed public would improve the level of understanding of the dilemmas faced by government and stakeholders in

managing public resources. An outcome of this work will be a greater opportunity for informed discussion and the ability to better resolve such issues in an open, inclusive and accountable process.

It is expected that other issues will arise in the course of discussions on the Wild Salmon Policy that will require consideration and analysis by the PFRCC and possibly the production of background papers or advisories.

5. APPENDICES

5.1 Members and Staff

The Honourable John A. Fraser served as Chairman of the Council from inception until April 2005, and now continues to serve as a Council member. He is a former Minister for the Environment and Minister of Fisheries and served as the first elected Speaker of the House of Commons. He headed the Fraser River Sockeye Public Review Board investigating the salmon fishery and was also Canada's Ambassador for the Environment. He is an avid sport fisherman. In December 2004, Mr. Fraser was appointed chair of British Columbia's Pacific Salmon Forum.

Mark Angelo is Program Head and Instructor of the Fish, Wildlife and Recreational Department of the BC Institute of Technology. He is known across North America for his work as a river conservationist, habitat expert, and educator, and was awarded Canada's first National River Conservation Award.

Mary-Sue Atkinson has become a widely-known volunteer and advocate for fisheries conservation. She has served as a streamkeeper, and she has led public awareness campaigns and school programs to expand public awareness about watershed protection and survival of wild salmon.

Murray Chatwin is Vice President for Fisheries Management at Ocean Fisheries Ltd. He has been involved in the fishing sector all of his working life, and serves on an array of advisory committees and industry groups promoting sustainable fisheries practices and research to ensure effective resource use.

Merrill Fearon is the Executive Director of the Federation of BC Writers and has been involved in leading the creation of innovative educational programs and resources, including the Sturgeon General website to educate children about the Fraser River. She has worked with community stewardship groups to improve their information programs, and has been a director of the Save Our Fish Foundation.

Dr. Paul LeBlond is Professor Emeritus of Oceanography and Physics at the University of British Columbia. Located on Galiano Island, he has a particular interest in climate change impact. He chairs and serves on several prestigious science panels and advisory boards.

Dr. Jeff Marliave is Vice President of Marine Science at the Vancouver Aquarium. He is an extensively published scientist involved in hands-on research as a diver. He has been instrumental in providing leadership for the Council to deal effectively with several high-profile issues including salmon aquaculture and protection of pink salmon stocks.

Marilyn Murphy is the Executive Director of the Sport Fishing Institute of BC. She has spent her career involved in sportfishing as a fishing guide and lodge manager, contributing to the sustainable use of salmon resources. She is also currently the Chair of the BC Southern Sportfishing Advisory Board. She became a member of the Pacific Fisheries Resource Conservation Council in December 2003.

Marcel Shepert has previously been the executive Director of the Fraser Watershed Fisheries Secretariat (FRAFS) and also a fisheries program manager and coordinator for the Carrier Sekani Tribal Council. Located in Prince George, he has been instrumental as a leader and representative of First Nations' interests in resource management, negotiations and conflict resolution.

Dr. Richard Beamish is an ex-officio member representing Fisheries & Oceans Canada.

Arnie Narcisse is an ex-officio member representing the BC Aboriginal Fisheries Commission, an organization he also chairs.

Gordon Ennis—Council's Secretariat Manager

Dr. Blair Holtby—Council's Scientific Advisor

Dory MacLellan—Assistant to the Chairman

Priscilla Singh—Council's Administrator (January to August)

Natasha Delorme—Council's Administrator (August to December)

5.2 Council Publications

Annual Report 1998-1999 (Released June 1999) This report and its four accompanying background papers were the first products of the Pacific Fisheries Resource Conservation Council. Together they were intended to present a package of information and advice to governments and the Canadian public on the conservation of Pacific fish populations and habitat in British Columbia.

Freshwater Habitat (Background paper authored by Dr. Marvin Rosenau and Mark Angelo, June 1999) Salmon and steelhead habitats in British Columbia are almost as varied as the province's geography. The rich biological diversity of species and stocks of salmonids—the family to which salmon and steelhead belong—is an evolutionary response to the physical and chemical variability of the habitats in which these fish live.

Salmon Stocks (Background paper by Dr. Carl Walters and Josh Korman, June 1999) Providing a broad species-by-species overview of stock status and trends for BC as a whole, this paper presents an overview of the fisheries management issues associated with determining stock status. The aim is not to provide a detailed or complete enumeration of all local conservation issues, but rather to highlight major concerns, and to identify needs for more detailed analysis.

Fraser River Sockeye (Background paper authored by Dr. Richard Routledge and Ken Wilson, June 1999) This paper details historical trends regarding Fraser River sockeye runs. It also addresses management concerns and concludes with recommendations.

Coast-Wide Coho (Background paper authored by Dr. Richard Routledge and Ken Wilson, June 1999) Canada's management and protection of freshwater coho habitat leaves much to be desired. The effect of loss and degradation of freshwater coho habitat in the decline of southern BC coho is complex. There are very few pristine watersheds in southern BC. Loss and degradation of freshwater coho habitat is very widespread. Most biologists agree that we have lost productive coho habitat, and that habitat loss represents a significant long-term threat to wild coho production.

Climate Change and Salmon Stocks (October 1999 conference summary) This one-day workshop hosted by the PFRCC focused on the questions, "What is the most alarming potential impact of climate change on salmon stocks?" and "What is the best strategy to adopt?"

Annual Report 1999–2000 (Released May 2000) This annual report of the Council reviews the state of salmon stocks and related habitat conditions, and includes particular attention to a set of areas, salmon populations and habitat situations that are at-risk. It looks at four issues in particular—climate change, the *Pacific Salmon Treaty*, salmon in the Central Coast, and strategic management.

Water Use Planning: A Tool to Restore Salmon and Steelhead Habitat in British Columbia Streams (Background paper by Dr. Marvin Rosenau and Mark Angelo, May 2000) Currently, many western North American heritage plants and animals are being lost due to careless use of water and this cannot be rectified until they attain preferred status for access to this important life-giving resource. Salmon and steelhead populations are among the species impacted by excessive human use of water.

Review of the Coho and Chinook Salmon Sections of the "Agreement Under the Pacific Salmon Treaty" between Canada and the United States, dated 30 June 1999 (Background paper by Randall Peterman and Brian Pyper, May 2000) This report reviews the "Agreement under the *Pacific Salmon Treaty*" between Canada and the United States. The terms of reference given to the authors by the PFRCC focused this review on how adequately the Aggregate Abundance-Based Management rules specified in the Agreement would deal with conservation issues for Canadian coho and chinook salmon.

Sand and Gravel Management and Fish-Habitat Protection in British Columbia Salmon and Steelhead Streams (Background paper by Dr. Marvin Rosenau and Mark Angelo, May 2000) Sand, gravel and other sediments within and adjacent to spawning and rearing streambeds are fundamental to the productivity of salmon and steelhead stocks. The high levels of production formerly seen in many of British Columbia's chum, pink and sockeye populations were, in part, the result of the conditions of the spawning sediments, primarily gravel, available for these fish. For instance, the quality of the freshwater rearing environment for coho, chinook and steelhead is more crucial than the amount of spawning area.

State of Salmon Conservation in the Central Coast Area (Background paper by Allen Wood, May 2000) Areas 6 to 10 of British Columbia's Central Coast were selected for study because this region provides a good measure of the current state of domestic stocks and their management. This is one of the few relatively undeveloped areas left on the coast.

The Wild Salmon Policy and the Future of the Salmonid Enhancement Program (Council Advisory, June 2000) The March 2000 *Wild Salmon Policy Discussion Paper* was part of a series of Fisheries and Oceans Canada projects flowing from the New Directions policy initiative which was begun in October 1998. The New Directions initiative was being developed in tandem with the Pacific Fisheries Adjustment and Restructuring Program. Fisheries and Oceans engaged in a round of public consultations with respect to its proposed Wild Salmon Policy, as well as the future of the Salmonid Enhancement Program, and the PFRCC provides its views in this Advisory.

Salmon Conservation in the Central Coast (Council Advisory and background paper prepared for the Council by Allen Wood, March 2001) The conservation status of chinook and coho salmon populations in the Central Coast has become a matter of growing concern. Poor returns of salmon and other important fish species have undermined the commercial and aboriginal fisheries and affected communities throughout the region. The PFRCC's sponsorship of this background paper was intended to provide a factual and analytical basis for the Council members to provide comments and recommendations, and to present technical information that can enable the public to understand the situation.

A Crisis in Fisheries Education (Council Advisory, September 2001) Effective management of fisheries on sound conservation principles is essential if we are to maintain both biodiversity and healthy salmon stocks in British Columbia. The human resources in the fisheries sector and the skills they apply are increasingly crucial to the success of activities intended to safeguard and enhance the prospects for wild salmon.

The Role of Public Groups in Protecting and Restoring Freshwater Habitats in British Columbia, with a Special Emphasis on Urban Streams (Background paper by Dr. Marvin Rosenau and Mark Angelo, September 2001) There has been an upsurge of community and public involvement in the protection and rehabilitation of British Columbia rivers and streams, and an evolution towards a more collective engagement in the management of these resources. This has begun to result in some remarkable successes.

Annual Report 2000–2001 (Released December 2001) This report provides a preliminary summary of the state of stocks in 2001. It is preliminary because final spawner counts will not be available for a number of months. The report also summarizes research findings and thinking to date on the subject. Lastly, some related issues are discussed, and some important conservation and management questions are put forward.

Annual Report 2001–2002 (Released October 2002) This report is innovative in assembling information that is not otherwise available to the public in any other publication. It considers Pacific salmon in four regions of southern BC: Fraser River basin; Okanagan; Strait of Georgia; and West Coast of Vancouver Island. For each region and species, the report summarizes trends in spawning population sizes since the early 1950s, explains the annual monitoring of these populations, and identifies conservation concerns.

The Protection of Broughton Archipelago Pink Salmon Stocks (Council Advisory, November 2002) The European experience indicates that sea lice abundance can be associated with salmon farming. This advisory makes recommendations on how to safeguard the wild pink salmon runs of the Broughton Archipelago.

Making Sense of the Salmon Aquaculture Debate: Analysis of issues related to netcage salmon farming and wild salmon in British Columbia (Report commissioned by the PFRCC, prepared by Julia Gardner, Ph.D., and David L. Peterson, January 2003) This report takes a look behind the debate, examines the information and assumptions supporting the arguments of opposing interests, and deepens the current public understanding about the potential impacts of salmon aquaculture on wild salmon. The report's focus was on the interplay of salmon farming and wild salmon, not on all aspects of the potential impacts of salmon farming. Instead, the report concentrates on the most pressing issues pertaining to farmed salmon/wild salmon interactions.

Wild Salmon and Aquaculture in British Columbia (Council Advisory, January 2003) This Advisory provides information and recommendations for action on the potential and perceived impacts of salmon netcage aquaculture on wild salmon and their habitat in British Columbia.

The Salmon Aquaculture Forum: Discussion Paper on Practices & Findings (Authored by the Honourable John A. Fraser and Kenneth Beeson, December 2003) The authors report on their extensive stakeholder discussions and public policy research on best practices across North America and Britain to produce this paper on resolving salmon aquaculture controversies and establishing consensus on the future of fish farming. It cites the importance of First Nations

involvement and constructive public participation. It suggests a broader framework and initiatives for government advisory systems to work more productively.

The Salmon Aquaculture Forum: Briefing Note to Ministers (Authored by the Honourable John A. Fraser and Kenneth Beeson, December 2003) This report sets out the principles and criteria for the new Forum, and proposes the key elements that will be necessary to make it acceptable to all participants and effective in fostering public dialogue and understanding of the issues. It offers some alternatives in terms of the scope and scale of the Forum's activity.

Annual Report 2002–2003 (Released August 2003) This annual report puts forward the current findings related to stock status and habitat conditions, and it presents a summary of the Council's viewpoint on some of the most significant and immediate matters of concern. In some instances, the comments summarize and clarify the positions explained in previous Council reports. In other cases, such as salmon aquaculture, this report contains the Council's more recent consensus views.

Conflicts Between People and Fish for Water: Two British Columbia Salmon and Steelhead Rearing Streams in Need of Flows (Background paper authored by Dr. Marvin Rosenau and Mark Angelo, September 2003) Using the Nicola and Englishman rivers as examples, this background paper explains how water levels and flows influence the productivity of salmon. It describes the regulatory regimes for water access and how there has been increasing competition for water for urban development, agricultural and industrial uses. It suggests adopting a hydrological budgeting process to allocate water to fish and other uses in a fair and transparent manner, and enforcing the water license system more effectively.

Pacific Salmon Resources in Central and North Coast British **Columbia** (Authored by Dr. Brian Riddell, February 2004) This report summarizes the status of all salmon stocks in the central and north coast areas of BC and complements Council's 2002 report on the status of south coast salmon stocks. Data on escapements are presented, over time, for all five species of Pacific salmon. Inconsistent and inadequate data have created assessment challenges. While these salmon are threatened by economic development, climate change and human population growth they also remain a diverse, highly dynamic and resilient group of species.

Advisory: Salmon Conservation Challenges in British Columbia with particular reference to Central and North Coast (Council Advisory, February 2004) This report summarizes Council's advice based upon an extensive analysis of the status of all salmon stocks in the central and north coast areas of BC. The advisory points out serious shortcomings in DFO's salmon assessment program. Budgets for assessment are decreasing at a time when international protocols, the new Species at Risk Act and an increasingly aware and concerned public demand better information. This Council advisory recommends the development and funding of a core assessment program aimed at the generation of quality information.

Making Sense of the Debate about Hatchery Impacts: Interactions Between Enhanced and Wild Salmon on Canada's Pacific Coast (Report commissioned by the PFRCC and prepared by Julia Gardner, David L. Peterson, Allen Wood and Vicki Maloney, March 2004) This report sets out the various positions that have been expressed by scientists and others, with a focus on potential harmful interactions between enhanced and wild salmon. It explores the opinions and arguments surrounding the impacts and explains the various concepts, theories, practices and research in this field. Risks are examined in the context of the tendency to over-harvest un-enhanced stocks where mixed-stock fisheries occur, genetic impacts, ecological impacts, disease and negative impacts on habitat from the enhancement facilities.

Annual Report 2003 (March 2004, released April 2004) This annual report summarizes initial findings from Council's extensive analysis of the status of all salmon stocks in the central and north coast areas of BC. This report also provides a summary analysis of past recommendations to both levels of government and the influence that advice had on government decisions. This advice is summarized in terms of five topics or themes: biodiversity of Pacific salmon, effective management, adequacy of information, risk minimization and the development of a guiding policy framework.

Does Over-Escapement Cause Salmon Stock Collapse? (Technical paper prepared by C. Walters, P. LeBlond and B. Riddell, April 2004) This report looked at all available information from British Columbia on whether large spawning populations that exceeded "normal", target or historical numbers, were followed by stock collapses. There was evidence that there was a leveling-off of salmon production for runs having a high escapement, but there was no evidence of over-escapement causing stock collapse.

Reality Stewardship: Survival of the Fittest for Community Salmon Groups (Report commissioned by the PFRCC and the Vancouver Foundation, prepared by Brian Harvey and David Greer, July 2004) Given funding cuts from government, this report recommends strategies for survival including a focus on activities that will appeal to private donors and foundations. Projects are suggested that will allow volunteers and professionals to work together rather than compete for limited funds, and require the science-based planning approach that has sometimes been missing from ad-hoc community stewardship. Among their recommendations, the authors propose forming consortia with fund-raising and management skills and local political support.

The Evolution of Commercial Salmon Fisheries in British Columbia (Report commissioned by the PFRCC, prepared by Stuart Nelson and Bruce Turris, December 2004) This paper traces the trends in fisheries management from the 1960s to the present period. The report does much to inform the public on how the fishery has evolved from a large industrial scale to the current smaller more controlled scale designed to improve salmon conservation. The commercial salmon fishery has undergone significant changes to improve conservation of the salmon resource. The report argues that the high conservation bar set to protect wild salmon and economically viable commercial fisheries are not mutually exclusive.

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